

U.S. Department Of Energy
Washington, D.C.

Secretary of Energy
NOTICE
SEN-23-90
DATE: 5-21-90

SUBJECT: SUPPORT FOR SCIENCE, MATHEMATICS AND ENGINEERING EDUCATION

The purpose of this Notice is to establish a Departmental policy in support of science, mathematics and engineering education.

This Department's ability to meet and solve its many pressing national challenges depends as much, perhaps more so, on the availability of human resources as on financial or natural resources. And yet there is growing evidence that our human resources, particularly those in scientific and technical fields, may not be adequate both in numbers and quality to meet our future needs.

Therefore, it is my intention to utilize fully the significant resources of the Department, its Federal and contractor employees, and its national laboratories and research facilities, to assist in the critically important national effort to strengthen and improve mathematics and science education fundamental to the production of qualified mathematicians, scientists, engineers and technicians.

Beginning with the landmark 1983 report, A Nation at Risk, over 200 studies and assessments have documented the serious decline in the quality of U.S. education, particularly in science and mathematics. By every current measure, U.S. student achievement in science and mathematics is unacceptably low. Moreover, the numbers of U.S. students interested in pursuing careers in a scientific or technical field are also declining due not only to simple demographic changes, but also, more seriously, to the minimal numbers of students, particularly women and underrepresented minority students, interested in these career areas. Yet, an estimated 85 percent of the net entering U.S. work force by 2000 will be women, minorities and immigrants.

The President has clearly recognized the nature of this impending crisis, and with the Governors has established National Education Goals. One of these particularly relevant to our work is "By the year 2000, U.S. students will be the first in the world in science and mathematics achievement."

All of the Department's organizational elements should take appropriate steps to use their resources in a way that supports science and mathematics education at both the precollege and university levels. Because of our unique collection of scientific and technical resources, this Department has the potential to set a highly visible and creative example of educational collaboration and assistance for the public and private sectors.

My first step in committing the Department to this challenge was to co-host with Nobel laureate Glenn Seaborg a major action-oriented mathematics and science education conference in October 1989 at the Lawrence Hall of Science in Berkeley. This conference involved 250 leaders in education, industry and the government, and specifically dealt with how the resources of the Department could be engaged to assist in achieving the President's goal. The Berkeley conference has led to the development of a number of major science and mathematics education initiatives, many centered around our national laboratories and research facilities, others to be carried out in collaboration with public and private sector partners. The report from the conference has also served as the foundation for the chapter on human resources in the National Energy Strategy Interim Report. The bottom line of the recommendations from this conference is that the Department of Energy -- its staff, facilities and research laboratories -- can make significant and long-term contributions to improving U.S. science and mathematics education including at the precollege level.

Within this context, the Department shall use, to the extent practicable and

available, its resources to help strengthen science and mathematics education in the U.S. In pursuing this initiative, I want to pay special attention to the following goals:

1. The Nation's youth from kindergarten through high school must be given a strong technical foundation on which to base future success in higher education and in science and mathematics careers;
2. The Nation's science and mathematics teachers must have in-depth and state-of-the-art training so they can present science and mathematics concepts in ways that spark student interest and understanding; and,
3. Special effort must be directed at encouraging and supporting more women, minority, disabled and disadvantaged students in mathematics and science at the precollege through university levels.

In order to achieve these goals, I specifically ask that all Department and contractor staff personally consider how they individually and collectively can become involved in science and mathematics education improvement. I also ask all Department program offices, both in headquarters and the field, and the Department's laboratories and contractor research facilities, in a manner consistent with their operating contracts, to commit to the following:

1. Take full advantage of the unique resources and facilities of the Department's national laboratories and research facilities for assistance in science and mathematics education improvement. I ask that each Department laboratory and research facility make an institutional commitment to participate in science and mathematics education programs with direct programmatic funding and through the use of overhead support. A number of laboratories have already established formal science education centers to carry out a range of precollege and university-level science and mathematics education programs including providing "hands-on" research experiences for teachers, students and faculty members. All Department research programs should recognize and provide support, as appropriate, for these unique laboratory capabilities.
2. Provide technical assistance and support to science and mathematics education improvement through the loan of scientific equipment to precollege schools involved in formal partnerships with DOE facilities and offices, and through the use of Department scientists, engineers, and other staff who can serve as expert partners with teachers to bring "cutting-edge" science to the classroom. This includes the development by each laboratory and facility of precollege science and mathematics education activities particularly suited to local and regional circumstances for example, inner city or rural schools;
3. Work with surrounding schools and communities to improve science and mathematics education through such efforts as encouraging volunteerism and community service by both Federal and contractor employees and by providing opportunities for teachers, students and concerned groups and individuals to participate in laboratory research and related education programs;
4. Develop "science alliances" and other cooperative programs, directed at ensuring sustained and long-term improvement in science and mathematics education, between the Department and its laboratories with the private sector, universities, professional scientific and technical societies, teacher associations, school districts, other federal agencies, science-technology centers, museums and community groups. I want to particularly call attention in this context to the very successful science alliances already established between Department laboratories and minority universities and colleges and the importance of providing continuing and long-term support to these alliances; and,
5. Support and encourage science and engineering professionals, including retirees, to pursue "second careers" as science and mathematics teachers through alternative certification and streamlined credentialing.

In order to facilitate incorporation of this policy, there shall be an

Office of University and Science Education Programs established in the Office of Energy Research (ER), to coordinate the implementation of all Department programs in science, mathematics and engineering education at the precollege and university levels. This office will be headed by an Associate Director of ER.

I expect the Director of ER to provide a cross-cut analysis on science, mathematics and engineering education support by all Department programs to me prior to the annual Internal Review Budget. The Director of ER will also prepare an annual report to me on the status of the implementation of this policy.

I intend to be directly involved with the education activities of the Department, and expect periodic briefings and reports.

James D. Watkins
Admiral, U.S. Navy (Retired)